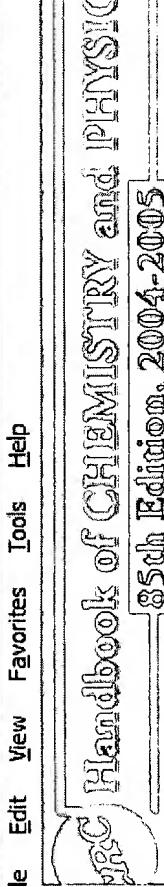


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## HIGH TEMPERATURE SUPERCONDUCTORS

C. N. R. Rao and A. K. Raychaudhuri

The following tables give properties of a number of high temperature superconductors. Table 1 lists the crystal structure (space group and lattice constants) and the critical transition temperature  $T_c$  for the more important high temperature superconductors so far studied. Table 2 gives energy gap, critical current density, and penetration depth in the superconducting state. Table 3 gives electrical and thermal properties of some of these materials in the normal state. The tables were prepared in November 1992 and updated in November 1994.

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**Table 1**  
**Structural Parameters and Approximate  $T_c$  Values of High-Temperature Superconductors**

Material	Structure	$T_c$ /K (maximum value)
$\text{La}_2\text{CuO}_{4+\delta}$	Bmab; $a = 5.355$ , $b = 5.401$ , $c = 13.15$ Å	39
$\text{La}_{2-x}\text{Sr}_x(\text{Ba}_x)_2\text{CuO}_4$	I4/mmm; $a = 3.779$ , $c = 13.23$ Å	35
$\text{La}_2\text{Ca}_{1-x}\text{Sr}_x\text{Cu}_2\text{O}_6$	I4/mmm; $a = 3.825$ , $c = 19.42$ Å	60
$\text{YBa}_2\text{Cu}_3\text{O}_7$	Pmmm; $a = 3.821$ , $b = 3.885$ , $c = 11.676$ Å	93
$\text{YBa}_2\text{Cu}_4\text{O}_8$	Ammm; $a = 3.84$ , $b = 3.87$ , $c = 27.24$ Å	80
$\text{Y}_2\text{Ba}_4\text{Cu}_7\text{O}_{15}$	Ammm; $a = 3.851$ , $b = 3.869$ , $c = 50.29$ Å	93
$\text{Bi}_2\text{Sr}_2\text{CuO}_6$	Amaa; $a = 5.362$ , $b = 5.374$ , $c = 24.622$ Å	10
$\text{Bi}_2\text{CaSr}_2\text{Cu}_2\text{O}_8$	$\text{A}_2\text{aa}$ ; $a = 5.409$ , $b = 5.420$ , $c = 30.93$ Å	92
$\text{Bi}_2\text{Ca}_2\text{Sr}_2\text{Cu}_3\text{O}_{10}$	$\text{A}_2\text{aa}$ ; $a = 5.39$ , $b = 5.40$ , $c = 37$ Å	110
$\text{Bi}_2\text{Sr}_2(\text{Ln}_{1-x}\text{Ce}_x)_2\text{Cu}_2\text{O}_{10}$	P4/mmm; $a = 3.888$ , $c = 17.28$ Å	25
$\text{Tl}_2\text{Ba}_2\text{CuO}_6$	$\text{A}_2\text{aa}$ ; $a = 5.468$ , $b = 5.472$ , $c = 23.238$ Å; I4/mmm; $a = 3.866$ , $c = 23.239$ Å	92
$\text{Tl}_2\text{CaBa}_2\text{Cu}_2\text{O}_8$	I4/mmm; $a = 3.855$ , $c = 29.318$ Å	119
$\text{Tl}_2\text{Ca}_2\text{Ba}_2\text{Cu}_3\text{O}_{10}$	I4/mmm; $a = 3.85$ , $c = 35.9$ Å	128
$\text{Tl}(\text{BaLa})\text{CuO}_5$	P4/mmm; $a = 3.83$ , $c = 9.55$ Å	40
$\text{Tl}(\text{SrLa})\text{CuO}_5$	P4/mmm; $a = 3.7$ , $c = 9$ Å	40
$(\text{Tl}_{0.5}\text{Pb}_{0.5})\text{Sr}_2\text{CuO}_5$	P4/mmm; $a = 3.738$ , $c = 9.01$ Å	40
$\text{TlCaBa}_2\text{Cu}_2\text{O}_7$	P4/mmm; $a = 3.856$ , $c = 12.754$ Å	103
$(\text{Tl}_{0.5}\text{Pb}_{0.5})\text{CaSr}_2\text{Cu}_2\text{O}_7$	P4/mmm; $a = 3.80$ , $c = 12.05$ Å	90
$\text{TlSr}_2\text{Y}_{0.5}\text{Ca}_{0.5}\text{Cu}_2\text{O}_7$	P4/mmm; $a = 3.80$ , $c = 12.10$ Å	90
$\text{TlCa}_2\text{Ba}_2\text{Cu}_3\text{O}_8$	P4/mmm; $a = 3.853$ , $c = 15.913$ Å	110
$(\text{Tl}_{0.5}\text{Pb}_{0.5})\text{Sr}_2\text{Ca}_2\text{Cu}_2\text{O}_9$	P4/mmm; $a = 3.81$ , $c = 15.23$ Å	120
$\text{TlBa}_2(\text{La}_{1-x}\text{Ce}_x)_2\text{Cu}_2\text{O}_9$	I4/mmm; $a = 3.8$ , $c = 29.5$ Å	40
$\text{Pb}_2\text{Sr}_2\text{La}_{0.5}\text{Ca}_{0.5}\text{Cu}_3\text{O}_8$	Cmmm; $a = 5.435$ , $b = 5.463$ , $c = 15.817$ Å	70
$\text{Pb}_2(\text{Sr},\text{La})_2\text{Cu}_2\text{O}_6$	P22; $a = 5.333$ , $b = 5.421$ , $c = 12.609$ Å	32
$(\text{Pb},\text{Cu})\text{Sr}_2(\text{La},\text{Ca})\text{Cu}_2\text{O}_7$	P4/mmm; $a = 3.820$ , $c = 11.826$ Å	50
$(\text{Pb},\text{Cu})(\text{Sr},\text{Eu})(\text{Eu},\text{Ce})\text{Cu}_2\text{O}_x$	I4/mmm; $a = 3.837$ , $c = 29.01$ Å	25
$\text{Nd}_{2-x}\text{Ce}_x\text{CuO}_4$	I4/mmm; $a = 3.95$ , $c = 12.07$ Å	30
$\text{Ca}_{1-x}\text{Sr}_x\text{CuO}_2$	P4/mmm; $a = 3.902$ , $c = 3.35$ Å	110
$\text{Sr}_{1-x}\text{Nd}_x\text{CuO}_2$	P4/mmm; $a = 3.942$ , $c = 3.393$ Å	40
$\text{Ba}_{0.6}\text{K}_{0.4}\text{BiO}_3$	Pm3m; $a = 4.287$ Å	31
$\text{Rb}_2\text{CsC}_6\text{O}_6$	$a = 14.493$ Å	31
$\text{NdBa}_2\text{Cu}_3\text{O}_7$	Pmmm; $a = 3.878$ , $b = 3.913$ , $c = 11.753$	58